

Nucleonica: Web-Based Software Tools for Simulation and Analysis

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The authors present a description of a new web-based software portal for simulation and analysis for a wide range of commonly encountered nuclear science applications. Advantages of a web-based approach include availability where-ever there is internet access, intuitive user-friendly interface, remote access to high-power computing resources, avoidance of licensing issues, and continual maintenance, improvement, and addition of tools and techniques common to the nuclear science industry.

Nucleonica

Several years in the making at the European Commission's Institute for Transuranium Elements in Karlsruhe, Germany, the Nucleonica site has been tested and improved upon by experience with a broad sampling of students at training sessions conducted annually.

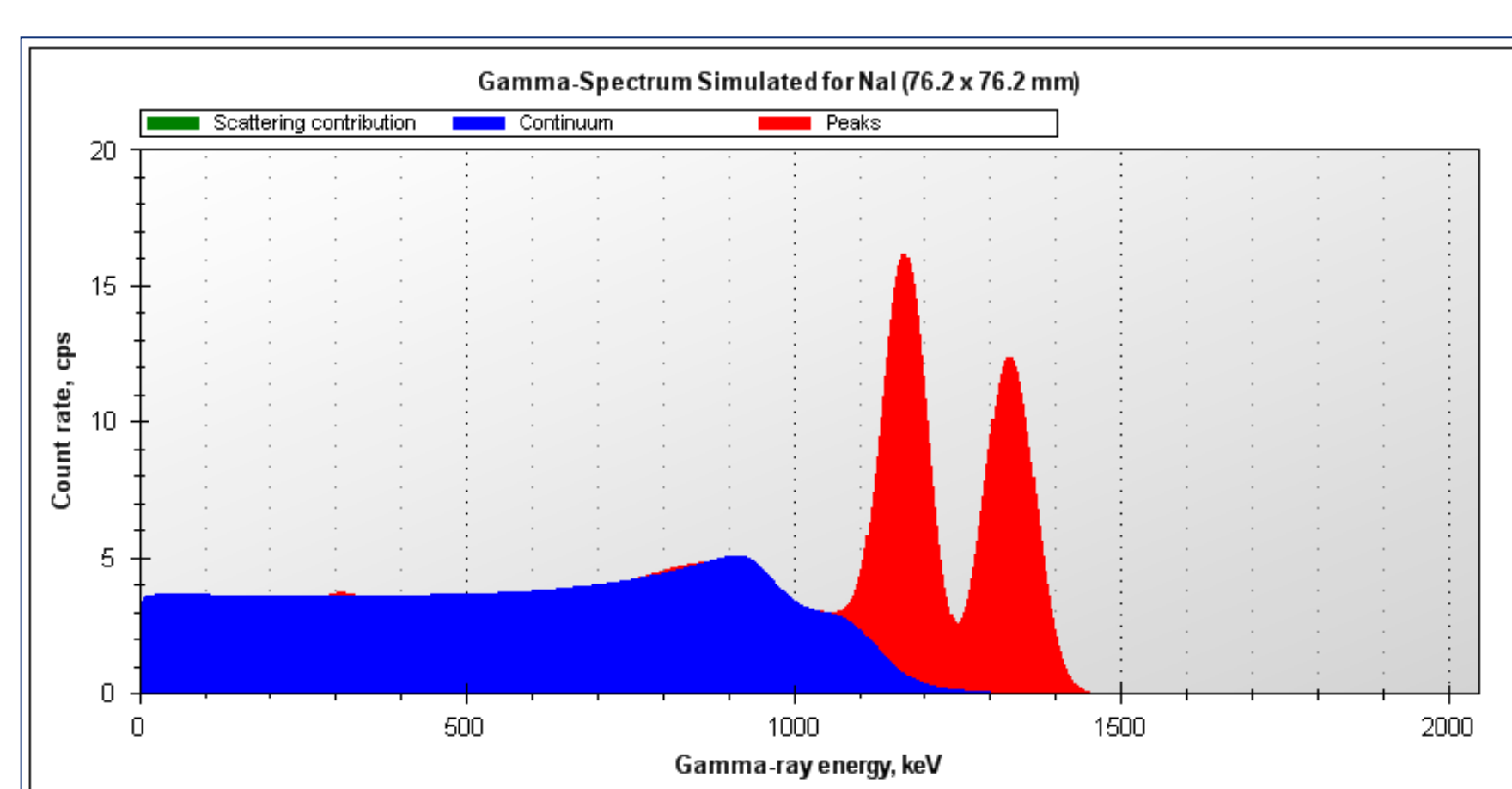
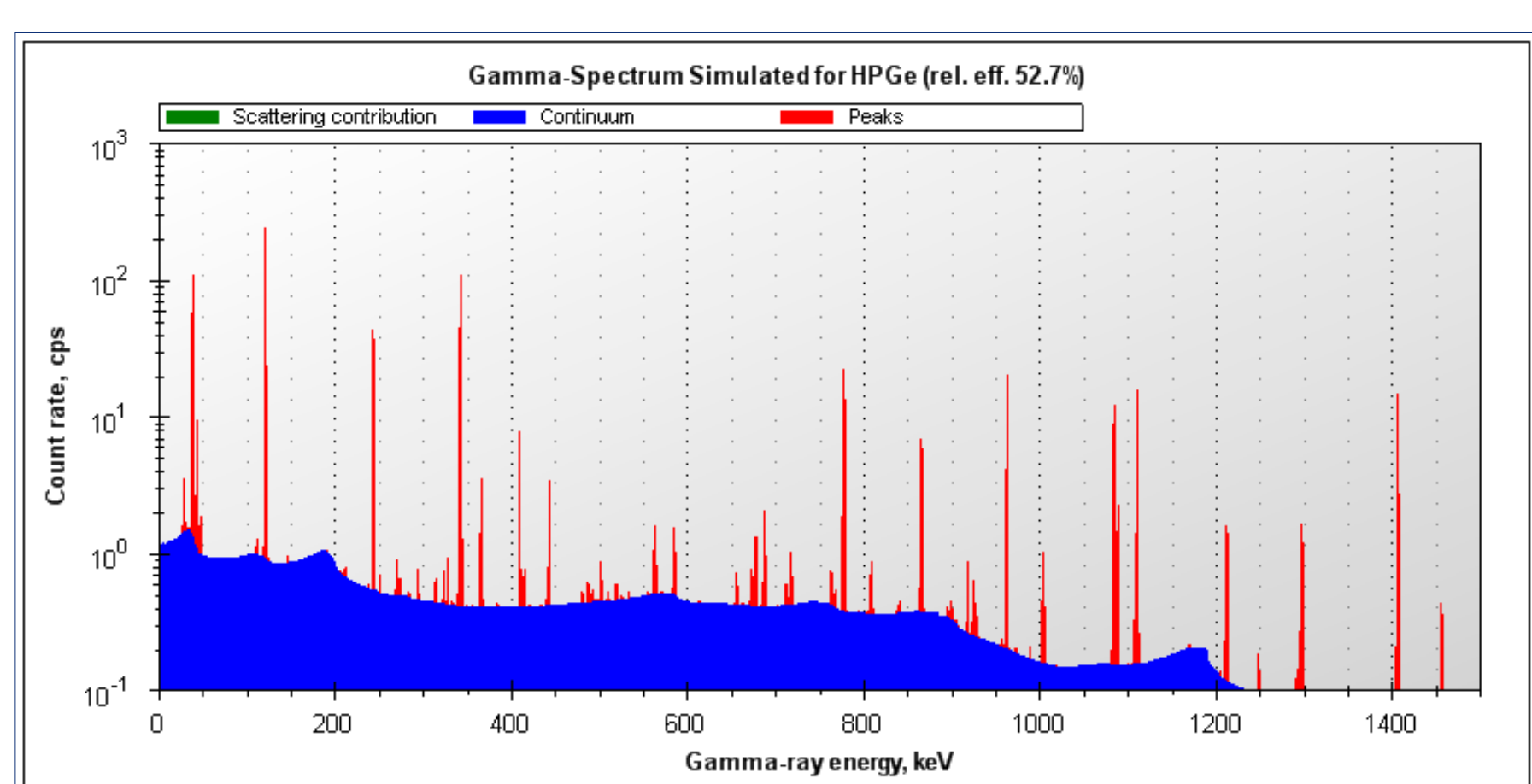
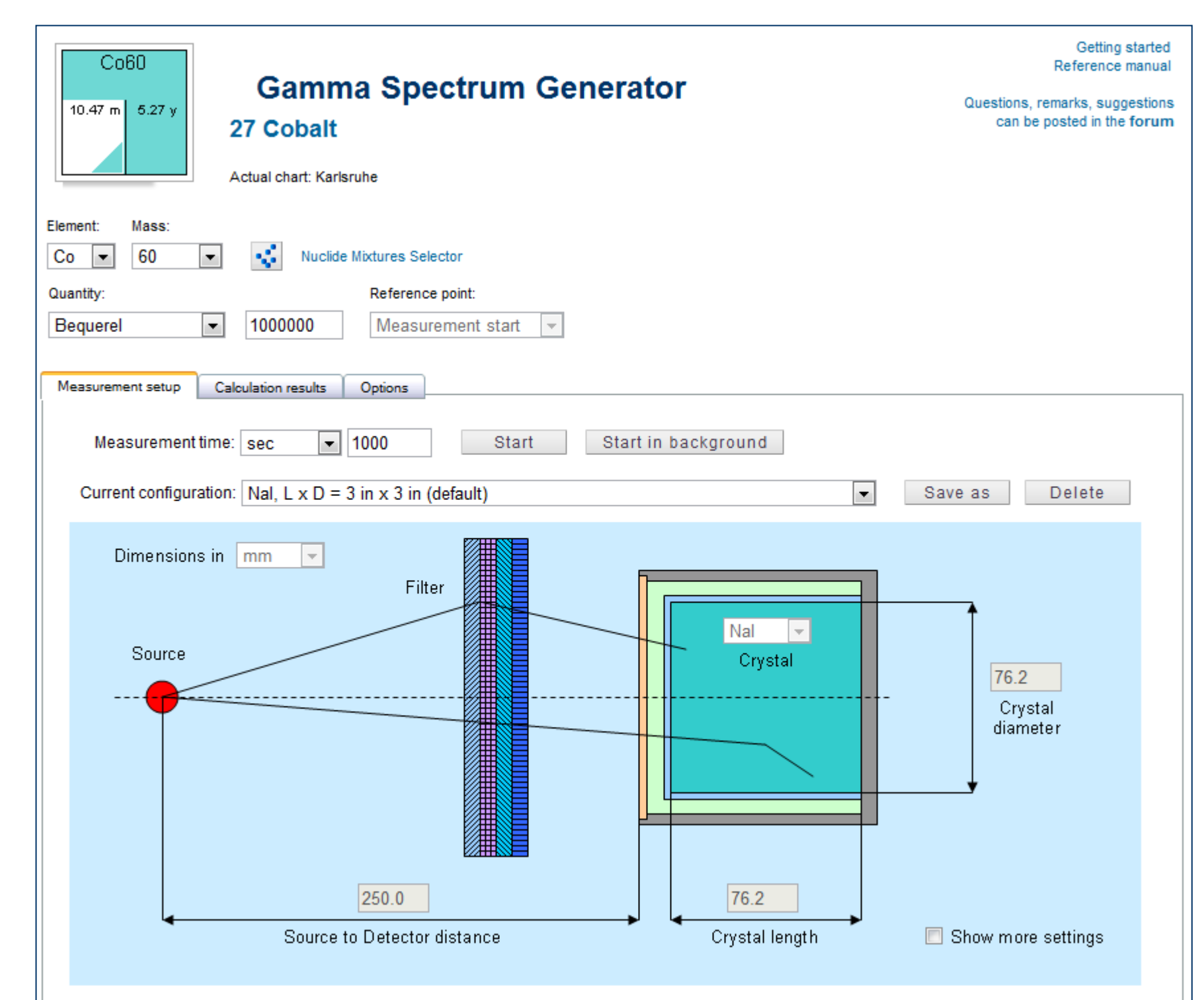
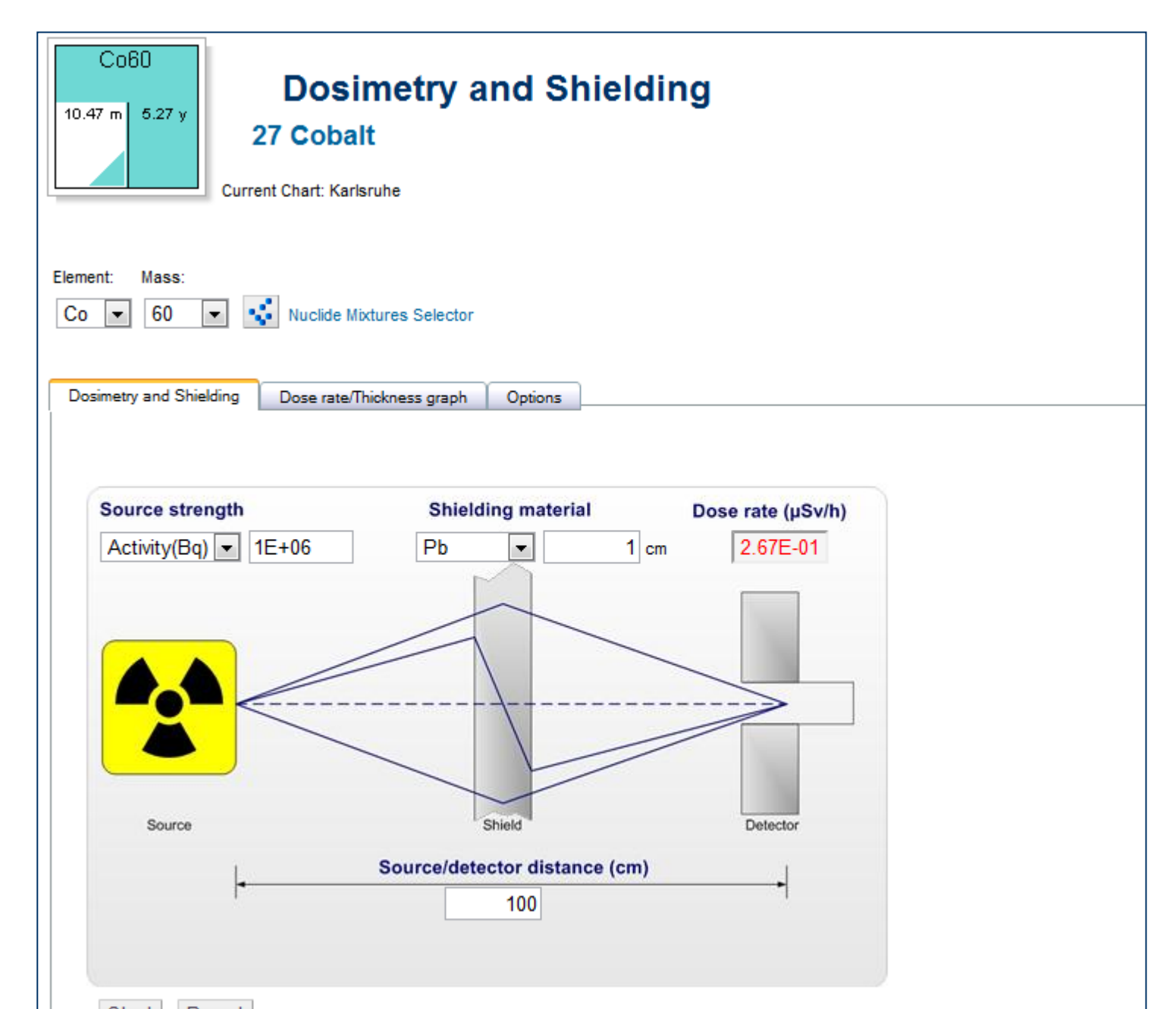
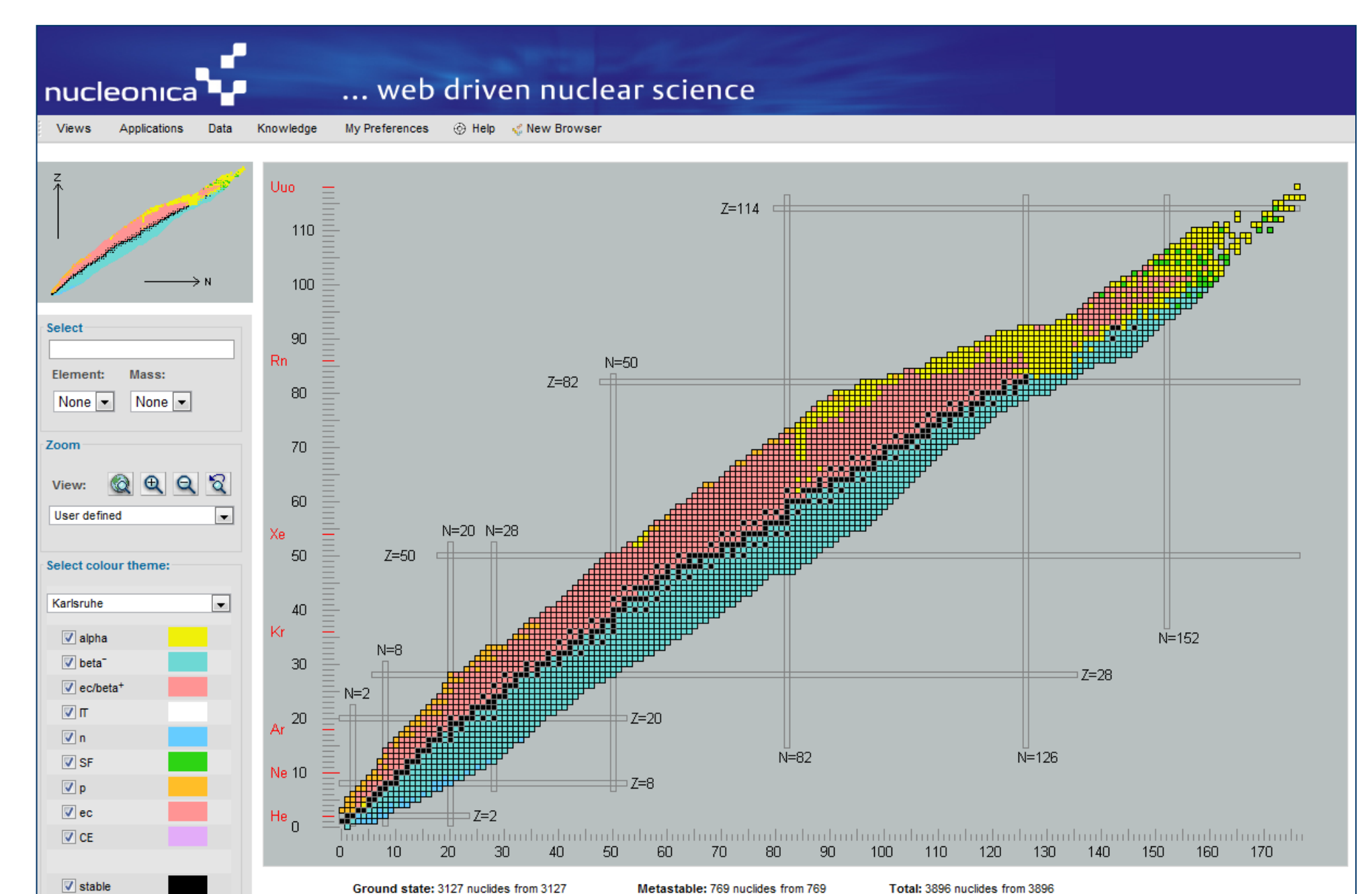
The site also serves as a forum for nuclear science news and for informal communication among the members of the international nuclear community, and provides a wide and growing range of reference materials commonly needed by professionals in the nuclear industry.

A brief description of the data resources, applications, and tools available at the Nucleonica site follows.

Nuclear Data pages: These include: nuclide charts with interactive links for selective search, nuclide data sheets, cross sections, physical constants, conversion factors, fission yields with fragment and product data, radiological exposure limits and dose coefficients, decay chain and neutron reaction path simulation.

Applications: include the mass activity calculator with nuclide mixture capability, Bateman solver, decay engine and decay engine for large nuclide sets with radiotoxicities and dose rates, dosimetry and shielding, range and stopping power, determination of spent fuel characteristics and neutron activation for user-selected fuel mixtures and burn-ups, nuclear material transport and packaging, gamma spectrum generation with shielding effects and responses for user-selected configurations of detectors and detector materials, file conversion from a wide variety of spectral file formats to other formats commonly used for analysis, gamma spectrum analysis software, beam simulations with radiobiology effect estimates,

Tools: publication-quality data graphical tools, and scientific calculator and calendar tools.



Further information: www.nucleonica.com

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